

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY  
BUREAU OF AIR, PERMIT SECTION  
1021 N. GRAND AVENUE EAST  
P.O. BOX 19276  
SPRINGFIELD, ILLINOIS 62794-9276  
217/782-2113

PROJECT SUMMARY  
FOR A CONSTRUCTION PERMIT APPLICATION  
FROM  
ILLINOIS VALLEY ETHANOL, LLC.  
FOR A  
ETHANOL PLANT  
IN DWIGHT, ILLINOIS

Site Identification No.: 105806AAF  
Application No.: 06050064  
Date Received: May 11, 2006

Schedule

Public Comment Period Begins: September 06, 2006  
Public Comment Period Closes: October 06, 2006

Illinois EPA Contacts

Permit Analyst: Minesh Patel  
Community Relations Coordinator: Brad Frost

## **I. INTRODUCTION**

Illinois Valley Ethanol, LLC. (Illinois Valley Ethanol) has proposed to construct an ethanol production facility in Dwight, Livingston County. The facility would produce 124 million gallons of ethanol per year. The construction of the proposed facility requires a permit from the Illinois EPA because of its associated air emissions.

## **II. PROJECT DESCRIPTION**

The principal products produced at ethanol plants are ethanol and distiller grains. The distiller grains are the grains with soluble that can be used as an animal feed. The ethanol is ethyl alcohol, made primarily from corn and various other grains and can be used as an octane enhancer in fuel, an oxygenated fuel additive that can reduce the carbon monoxide emissions from the vehicle.

Illinois Valley Ethanol has proposed to construct 124 million gallon per year dry mill ethanol plant. In this process corn is received by the rail or truck and screened for rocks and cobs before sent to storage bins. Corn is then transferred to a “day bin” by conveyor and metered to a hammermill by a weigh belt feeder. The PM emissions from these operations are controlled by baghouses.

The ground corn is then sent to enzymatic processing. In the enzymatic process ground corn is turned into fine slurry by adding water, heat and enzymes. The fine slurry is then sent to liquefaction process where other enzymes are added to convert the starches into glucose sugars. Next the corn slurry is sent to fermentation process where yeast is added to begin the fermentation process. The VOM emissions from fermenters and beer well would be controlled by CO<sub>2</sub> scrubber.

Distillation process utilizes a vacuum distillation system to separate the alcohol from the corn mash. Both streams are routed to the dehydration equipments to extract the ethanol. Ethanol is further refined to have 200 proof ethanol alcohols in molecular sieve. The ethanol is stored and denatured prior to sent out to customers. Mash stream from the dehydration equipments are sent to solids separation and evaporation equipments where excess water is removed to have “wet cake”. The water, “thin stillage” is pumped to an evaporator to produce thick syrup. The wet cake and thick syrup are conveyed to dryers to remove moisture and produce dried distillers grain with solubles (DDGS). The DDGS is conveyed to a storage area for cooling and readied for shipment via rail car or truck. The VOM emissions from principal distillation units along with other process tanks would be controlled by regenerative thermal oxidizers (oxidizer 1 and 2).

Two natural gas fired dryer systems will be sized to dry all wet cake produced at the proposed facility. The dried feed is then cooled as it is being conveyed to the feed storage area prior to shipping to customers. Each dryer and associated cooler are controlled by oxidizers 1 and 2. Oxidizers 1 and 2 also control emissions from certain emission units from mash preparation and distillation process and ethanol loadout operation. The PM emissions from feed handling and loading operation are controlled by baghouses.

A non-contact wet cooling tower would be used for process cooling. The PM emissions from cooling tower are controlled by mist eliminators.

Equipment components, such as valves, flanges, pump seals, ect., involved with fermentation and subsequent handling of ethanol and denaturant generates VOM emissions when they leak. These emissions will be minimized with a Leak Detection and Repair (LDAR) Program, which requires regular inspections of component for leaks and timely repairs of any leaking components.

Fugitive dust and particulate matter emissions are generated by vehicle traffic and wind blown dust on roadways, parking lots and other open areas at the plant. These emissions would be minimized with a Fugitive Dust Control Program as well as pavement of new roadways and the parking lots for the facility.

### **III. PROJECT EMISSIONS**

The annual emissions from the facility would be limited to 99.47 tons of NO<sub>x</sub>, 98.10 tons of CO, 98.63 tons of VOM, 98.84 tons of PM/PM<sub>10</sub>, and 66.85 tons of SO<sub>2</sub>. These limits are based on the maximum emissions requested by Illinois Valley Ethanol. These limits are based on achievement of average annual hourly emission rate as specified by the manufacturer of the equipments, standard emissions factors, engineering estimates, and the potential utilization of the facility as specified by Illinois Valley Ethanol. Actual annual emissions of the facility would be less than these limits to the extent that the actual performance of the equipment is better than projected and the equipments are not utilized as much.

### **IV. APPLICABLE EMISSION STANDARDS**

All emission sources in Illinois must comply with the Illinois Pollution Control Board's emission standards. The Board's emission standards represent the basic requirements for sources in Illinois. The proposed facility will readily comply with applicable state emission standards (35 Ill. Adm. Code: Subtitle B).

The facility is also subject to the federal New Source Performance Standards (NSPS), 40 CFR 60 Subpart Dc, for boiler systems. The Illinois EPA is administering NSPS in Illinois on behalf of the United States EPA under a delegation agreement. The boilers should readily comply with this standard.

### **V. APPLICABLE REGULATORY PROGRAMS**

This facility is not considered a new major stationary source under the federal rules for Prevention of Significant Deterioration of Air Quality (PSD), 40 CFR 52.21. This is because the potential emissions from the proposed facility, as limited by the permit, would be less than the major source thresholds for PSD.

### **VI. PROPOSED PERMIT**

The conditions of the draft permit for the facility contain limitations and requirements for the grain handling, fermentation system, distillation system, feed drying/cooling, ethanol storage/loading, and boilers to help assure that the facility complies with applicable regulatory requirements. The draft permit also identifies measures that must be used as good air pollution control practices to minimize emissions.

The draft permit includes enforceable limits on emissions and operation for the equipments to assure that facility remains below the levels at which it would be considered major for PSD. In addition to limiting annual emissions, the permit also includes limits on hourly emissions, annual ethanol production, and annual grain receipts.

The permit also establishes appropriate compliance procedures for the facility, including requirements for emission testing, monitoring, recordkeeping, and reporting. Emission testing is required as part of the initial shakedown and operation of the facility after completion of construction.

These measures are being imposed to assure that the emissions of the facility are accurately tracked to confirm compliance with both the short-term and annual emission limits established for them.

## **VII. REQUEST FOR COMMENTS**

It is the Illinois EPA's preliminary determination that the proposed permit meets all applicable state and federal air pollution control requirements. The Illinois EPA is therefore proposing to issue this permit.

Comments are requested on this proposed action by the Illinois EPA and the proposed conditions of the draft permit.